



Economics Research Associates

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INTRODUCTION

As part of the California Department of Transportation Aeronautics Division Aviation Economic Impact Study, Economics Research Associates (ERA) reviewed existing economic impact studies for the 13 primary hub airports in California and conducted a survey of airport managers for public use airports, excluding limited use airports. This working paper includes a summary of findings from existing economic impact studies for the 13 primary hub airports in California and highlights from ERA's survey of airport managers. It also contains a listing of special topic areas that were developed through the survey of airport managers.

PRIMARY HUB AIRPORTS ECONOMIC IMPACT STUDIES

There are 13 primary hub airports in California, as shown below:

- Palm Springs International Airport (PSP)
- Santa Barbara Municipal Airport
- Long Beach Municipal Airport (LGB)
- Oakland International Airport (OAK)
- Burbank-Glendale-Pasadena Airport
- John Wayne Airport
- Sacramento International Airport
- Ontario International Airport
- San Jose International Airport (SJC)
- Los Angeles International Airport (LAX)
- San Diego International Airport (SAN)
- San Francisco International Airport (SFO)
- Fresno Yosemite International Airport

These airports are an important part of the overall economic impact of California public use airports. All of them, with the exception of Fresno Yosemite International Airport, have recently conducted economic impact studies. ERA will use a cross-sectional analysis of the other primary hub airports, supplemented by information directly from Fresno Airport, to provide an order-of-magnitude estimate of the economic impact of Fresno Airport. This section presents a summary of the revenue, employment, income, and other impacts identified within these studies. These existing studies will provide the basis for ERA's quantitative analysis of these airports.

Palm Springs International Airport (PSP)

The most recent economic impact study for Palm Springs International Airport was the economic benefit analysis conducted as part of the Palm Springs master planning process. The study is titled "**Palm Springs Master Plan Appendix C: Palm Springs International Airport Economic Benefit Analysis**" and was conducted by Dr. Lee McPheters of Arizona State University.

Methodology

The geographic region analyzed was the airport's service area, defined as the area between Yucca Valley and Twentynine Palms to the North, Banning and Beaumont to the West, Hemet to the South, and Coachella Valley to Indio, Coachella, and Thermal to the Southeast. The year analyzed was FY 2001.

Information was collected through interviews and surveys of on-airport employers including private sector firms and government agencies, the airport staff, airline passengers, and general aviation flyers. The airport staff as well as suppliers and users of aviation services provided information on revenues, employment, and earnings.

The study examined direct and induced revenues, earnings, and jobs related to on-airport as well as air visitor benefits.

Highlights of the report are summarized under the categories below.

Business Revenue Impacts

- Direct business revenue impact totaled approximately \$130.8 million in FY 2001. This number includes the airlines, FAA tower, FBO services, terminal businesses, other airport tenants, government agencies, and capital improvement projects.
- In addition, over \$483.8 million in revenues was generated by air visitors as a result of the airport. This number includes expenditures on lodging, food and drink, retail goods and services, ground transportation, and entertainment.
- Total direct revenue benefits as a result of the airport were \$614.6 in FY 2001.

- Induced benefits totaled \$310.8 million, for a total of \$925.4 million in total revenue benefits.

Employment Impact

- Direct on-site jobs created by the revenue generated at PSP totaled 1,146 in 2001.
- An additional 9,634 direct jobs were created by air visitor revenue, for a total of 10,780 direct jobs created at the airport.
- Induced jobs totaled 4,186, for a grand total of 14,966 jobs.

Earnings Impact

- On-airport direct earnings totaled nearly \$48.2 million in FY 2001.
- Air visitor direct earnings benefits totaled an additional \$163.5 million, for a total of \$211.6 million.
- Induced benefits added another \$97.7 million, for a grand total of \$309.3 million in earnings benefits.

Tax Generation

- The direct tax revenue base in FY 2001 was \$614.6 million. Local tax revenues totaled \$46.1 million, and state tax revenues totaled \$9.8 million, for a total of \$55.9 million in direct tax revenues generated as a result of the airport.
- The induced tax revenue base was \$310.8 million. Local tax revenues induced by the airport totaled \$23.3 million, and state tax revenues induced totaled nearly \$5 million, for a total of \$28.3 million in induced tax revenues.
- In FY 2001, there was a grand total of \$84.2 million in local and state tax revenues (direct and induced) generated as a result of the airport.

Other Impacts

While the study focuses primarily upon quantitative impacts, the introduction to the report includes a discussion of qualitative services provided to the community by the airport. Among those listed are the following:

- The facilitation of commerce through the movements of air travelers and cargo with shorter time to destination than other modes of transport.
- The provision of essential services to a community, including enhanced medical care, support for law enforcement and fire control, and courier delivery of mail and high value parcels.

- The creation of a higher quality of life and more competitive environment for economic development.

Other Issues

The letter from the National Business Aircraft Association, Inc. indicates that the report might not fully include all business jet activity at the airport, value to the community of homes surrounding the airport, as well as businesses certain passengers bring to the community. Also, there was a previous study conducted in 1994.

Santa Barbara Municipal Airport (SBA)

The Santa Barbara Airport recently released its latest economic impact study dated August of 2001. This report titled “**Santa Barbara Airport - Economic Impact Report**” was prepared during the summer of 2001 by Booz Allen Hamilton and the University of Santa Barbara Economic Forecast Project.

Methodology

Information for the report was collected through surveys and focus group interviews with airport users, tenants on airport property and others. The Airport administration itself and the Santa Barbara County Economic Outlook 2001 provided additional information used as input for the report. From the direct impacts determined by surveys, the level of indirect jobs and overall output were estimated using multipliers. These multipliers are the RIMS II multipliers for the Santa Barbara region supplied by the U. S. Bureau of Economic Analysis. The South Coast Region, which is Santa Barbara County, is the geographic area of impact accounting.

The study examines three channels of impact creation: airport economic activity, general aviation and tourism. Each channel then has three sources of impact: direct, indirect and induced. Highlights of the report are summarized under these categories below.

Airport Economic Activity

- Direct aviation jobs at SBA totaled 911 in 2001.
- In addition the SBA had 624 non-aviation-related jobs in 2001.
- The total countywide impact of aviation related activity at SBA was \$149.5 million, including \$53 million in payroll, \$86.1 million in business expenditures and \$10.4 million in taxes.

General Aviation

- Most general aviation visitors to Santa Barbara were day-visitors, and about two-third were leisure rather than business visitor.

- The impact of these visitors totaled \$31.1 million, including \$4.2 million in tax revenue.

Tourism

- In the 2000-2001 study period, over 200,000 Santa Barbara County visitors passed through SBA. This visitor count is up 27 percent from a 1989-1990.
- These visitors spent \$542 million, creating 14,106 jobs and an overall economic impact of \$336.4 million.
- Forty-eight percent of the visitor coming through SBA stayed in hotels or motels, and they on average spent \$600 on lodging.
- Santa Barbara County hotel revenue totaled \$201 million, and \$62 million or 31 percent were generated from visitors arriving through the Airport.

Overall Impacts

- Total employment generated by SBA (counting direct, indirect and induced employment) amounted to 2,286 with annual wages of \$80 million.
- The total estimated economic impact was \$517 million, including \$141 million of direct, \$68 million of indirect and \$307 million of induced impact.
- Over the past eleven years, the overall economic impact of Santa Barbara Airport has grown by over 50 percent.
- Each commercial airline enplanement at SBA represents over \$665 to the South Coast economy.
- Each day the SBA contributes \$1.4 million to the local economy.

Other Issues

Although not formally in the geographic area of analysis, eleven percent of the visitors arriving via SBA stay in Ventura County. The visitor facilities in Ventura County derive significant benefit from their proximity to Santa Barbara Airport.

Long Beach Municipal Airport (LGB)

The most recent economic impact study conducted for the Long Beach Municipal Airport was in June 1993. The study was commissioned by the Long Beach Airport Task Force and the Greater Long Beach Chamber of Commerce and was conducted by Beach Cities Consulting, a group comprised of students from the Executive MBA program at the University of Southern California, Graduate School of Business Administration.

Methodology

This study examined the employment, payroll, capital expenditures, operating expenditures, and revenues of the Long Beach Municipal Airport. A voluntary survey of public and private firms that conduct business at or because of the Long Beach Airport. The overall response rate for the survey was 62 percent. Survey responses that were not airport related were not included as part of the analysis. The study utilized the Bureau of Economic Analysis (BEA) RIMS-II multiplier.

Survey Results

The survey results from this study were divided into three categories: direct impacts, indirect impacts, and induced impact.

- The total direct impact in 1992 was nearly \$522 million. Of this, over \$259 million was direct payroll expenditures and nearly \$263 million was a result of capital and operating expenditures. Direct payroll included employees of the airport, commercial aviation, general aviation, aircraft maintenance firms, and others. Capital expenditures included on-site construction and leasehold improvements.
- The total indirect impact was estimated at nearly \$68 million.. The indirect impacts were defined primarily as visitor expenditures for goods and services in the region, in addition to expenditures in the region by off-site, aviation-related businesses such as transportation and travel agencies. It was estimated in the study that visitor expenditures accounted for the majority, nearly \$65 million of this impact. The remaining \$3.1 million was comprised of payroll, capital expenditures, and operating expenditures by dependent firms.
- The induced impact of the Long Beach Airport was estimated to be nearly \$600 million and was determined by using the RIMS-II Los Angeles County multiplier for earnings and employment.
- Employment attributable to Long Beach Airport was estimated to be 23,275, of which, 5,950 was direct employment, 73 jobs were indirect, and 17,252 jobs were induced.

Survey Results by Operating Segments

The Long Beach Airport economic impact assessment also divided the economic and employment impacts into three operating segments: general aviation through McDonnell Douglas, the remainder of general aviation, and commercial aviation. The study found that 74 percent of the total economic impact was attributable to McDonnell Douglas, 19 percent to other general aviation, and 7 percent to commercial aviation. For employment, 77 percent was estimated to be attributable to McDonnell Douglas, 21 percent to other general aviation, and 2 percent to commercial aviation.

Estimate of Increased Commercial Aviation Impact

The study also examined several future scenarios with increased commercial aviation. When the study was conducted, the airport had a total of 17 daily commercial flights. The study estimated the impact of the airport with four future scenarios of 18, 20, 30, and 41 (the court mandated limit) commercial flights per day. The additional impact ranged from \$6.4 million and 92 jobs for one additional flight per day to \$149.7 million and 2,186 jobs for a total of 41 flights per day.

Other Issues

This study is useful as a benchmark, but has a few limitations. The major limitation is that it was conducted nearly 10 years ago, and there have been several changes at the airport since then. Second, the study does not address air cargo. Third, the study does not address community impacts beyond the quantitative impacts.

Oakland International Airport (OAK)

The most recent economic impact study conducted for Oakland International Airport (OAK) was as part of the Bay Area Economic Forum 1999 Report: “Air Transport and the Bay Area Economy.”

Methodology

The study utilizes methodology developed by Martin Associates of Lancaster, Pennsylvania. It traces and measures the airport ripple effect using 100 percent direct surveys of the airports, tenants, and vendors of the airports, as well as large sample surveys of foreign and domestic visitors. Customized computer models of spending and employment ratios supplemented these surveys. The year analyzed was FY 1998-99.

Direct Business Revenue Impact

The direct business revenue impact was divided into five sectors: airline/airport service, freight transportation, passenger ground transportation, contract construction/consulting services, and visitor industry revenue. A summary of the findings pertaining to direct business revenue impact is as follows:

- Total airport direct business revenue for OAK was \$3.9 billion. Visitor industry revenue was \$4.6 billion, for a total of \$8.6 billion in 1999.
- Of the total airport direct business revenue (not including visitor industry revenue), 32 percent was generated in the airline/airport service sector, 66 percent in the freight transportation sector, two percent in the passenger ground transportation sector, and less than one percent in the contract construction/consulting services sector.
- Visitor revenue included all domestic and foreign arrivals who are not residents of the Bay Area and not connecting to other flights.

- Oakland's revenue impact was particularly high for the number of flight operations at the airport. This high revenue to flight operation ratio was attributed primarily due to the large amount of air cargo.

Employment Impact

The total number of jobs generated by OAK was estimated to be 18,116.

- Direct jobs created by the revenue generated at OAK totaled 10,392. Induced jobs were 5,484, and indirect jobs were 2,240, for a total of 18,116.
- In addition, the visitor industry associated with the airport supported 63,440 direct jobs and 27,978 induced jobs, for a total of 91,418 jobs.
- In total, revenues generated by OAK and the supported visitor industry generated 109,534 jobs in the Bay Area.
- Of the 10,392 direct jobs created by revenues at OAK, 65 percent were in the airline/airport service sector, 29 percent in the freight transportation sector, five percent in the passenger ground transportation sector, and one percent in the contract construction/consulting services sector.

Personal Income Impact (Fiscal 1998-99)

- As a result of the direct employment at OAK, over \$1.4 billion of direct personal income was created, of which, \$297 million was site-generated and \$1.1 billion was visitor generated.
- An additional \$1.5 billion of personal income was induced by individual spending of this direct personal income (of which \$310 million was site generated and \$1.1 million was visitor generated).
- Indirect spending by firms totaled \$79 million.
- The total personal income impact including direct, induced, and indirect for OAK in 1998-99 was nearly \$3 billion.

Tax Generation

- OAK generated \$1.3 billion in federal taxes, of which, \$263 million was a result of site generated personal and corporate taxes, \$820 million was visitor-generated personal/corporate taxes, and \$248 million represented federal aviation specific tax revenue.
- OAK also generated \$673 million in state and local taxes, of which \$111 million was site-generated and \$562 million was visitor generated tax revenue.
- Direct payments to the City totaled \$3.2 million.

Other Impacts

This study also addressed the importance of the role that Bay Area airports play in the local community. This discussion included San Jose International and San Francisco International Airports as well:

- The three airports in the Bay Area make the region more competitive. For example, Bay Area trade is growing quickly, with merchandise and service exports totaling at least \$70 billion, and two-way flows of goods through Northern California amounting to nearly \$110 billion annually. Trade growth allowed the Bay Area to export its way out of recession in the 1990s, and supports market diversification and improved business success rates.
- Jobs at Bay Area firms of all types depend on the availability of air transport to move people and to move goods.
- Airport passenger and cargo capacity has a bearing on business locational and expansion decisions.
- Air transport has an affect on improved quality of life. It allows the Bay Area to attract top quality talent from around the world to live, work, and go to school in the region.
- The air transport system helps keep the Bay Area a major global player.

Other Issues

This study also examines the negative economic impacts of air capacity constraints, flight delays, and cancellations on business activities.

Burbank-Glendale-Pasadena Airport (BUR)

The Burbank-Glendale-Pasadena Airport Authority commissioned an economic benefits study for the airport that was published in January 1995. The study was conducted by Science Applications International Corporation (SAIC). Prior to that study, another study was conducted in 1987 by URS Corporation.

Methodology

There were four major objectives to the economic benefits study: 1) Analyze the economic significance of the airport to the cities of Burbank, Glendale, Pasadena, and Los Angeles, and the greater Los Angeles area; 2) Evaluate the local and regional employment and earnings resulting from airport operations; 3) Identify local tax revenues generated by the airport; and 4) Enable a better understanding of the economic interrelationships between local communities and the airport.

The study incorporated a mail survey of airport tenants and subtenants and airport-related businesses located off the airport. The survey had a 39 percent response rate. The BEA's RIMS-II multipliers were used to estimate indirect and induced economic and employment impacts.

Study Findings

This study was highly focused on the distribution of economic benefits throughout individual sub-regions and counties in Southern California. Overall, the total direct and secondary impact was estimated at \$878.2 million of earnings and expenditures, supporting 17,115 jobs. The breakdown of the total impact by category is as follows:

- Visitor expenditures accounted for the largest portion of the earnings and expenditures generated by the airport. Approximately 78 percent, or \$684.6 million was created by non-local visitors using the airport. Direct expenditures of the visitors totaled \$296.4 million, resulting in secondary earnings of \$388.1 million and 12,745 related jobs.
- The second largest category of impact was purchases of goods and services by airport tenants, subtenants, and airport-related businesses and secondary payrolls as a result of the multiplier effect. This category generated \$129.2 million in earnings and expenditures and 1,854 jobs.
- Direct payrolls of airport tenants, subtenants, and airport-related businesses and secondary payrolls resulting from the multiplier effect made up the remaining \$64.4 million of earnings and expenditures and 2,516 jobs.
- In addition, the study found that the airport generated several types of revenues from taxes for the City of Burbank and its Redevelopment Agency. Types of taxes included property taxes (the largest at \$3.6 million annually), sales tax, utility users tax, transient occupancy tax, and taxes from the sale of aircraft fuel.

Geographical Distribution of Economic Benefits

The study determined that Los Angeles County was the greatest benefactor of economic impact related to the airport. Nearly 92 percent of the earnings, expenditures, and employment generated by the airport were attributed to Los Angeles County. Details are provided below:

- Over \$805 million of earnings and expenditures and 15,667 jobs were attributed to Los Angeles County.
- The study estimated that Ventura County received \$68.5 million of the total earnings and expenditures and 1,301 jobs.
- Within Los Angeles County, \$162.5 million was generated in Burbank, \$110.6 million in Los Angeles, \$54.8 million in Glendale, and \$54.6 million in Pasadena.
- The airport generated approximately 3,012 jobs in Burbank, 2,507 jobs in Los Angeles, 1,098 jobs in Glendale, and 1,032 jobs in Pasadena.

Other Issues

The majority of this study is focused on the quantitative impacts of the Burbank-Glendale-Pasadena Airport on regions, counties, cities, and communities in Southern California. However, the introduction to the study does acknowledge the important catalytic role the airport plays in stimulating economic growth.

John Wayne Airport (SNA)

In 1993, John Wayne Airport in Orange County commissioned an economic impact study. The study was conducted by Wilbur Smith Associates (WSA).

Methodology

This study estimates the economic impact of John Wayne Airport on the Orange County economy and on the Southern California economy, including Orange, Imperial, Ventura, Los Angeles, Riverside, San Bernadino, and San Diego Counties. The study divides the impacts into three categories: 1) aviation provision impacts, 2) aviation use impacts, and 3) multiplier impacts. Aviation provision impacts are defined as the dollar value of business activities involved in the provision of airport and airport-related services, including airport-based activities of the airlines, airline support firms, car rental agencies, ground shuttle operators, general aviation firms, etc. Aviation use impacts are defined as the dollar value of activities associated with the use of airport services, such as general aviation air passenger and travel agency impacts.

The study utilized the BEA's RIMS-II multiplier system to develop estimates for economic activity, earnings, and jobs. WSA conducted a survey of airlines, airline support, car rental agencies, ground transport, airport tenants, general aviation firms, corporation aviation firms, and government operations related to the airport.

Summary of Findings

The overall economic impact of John Wayne Airport was estimated to be \$3.5 billion in economic activity, of which, \$1.1 billion was accounted for by earnings. The total employment generated by the airport was estimated to be 57,440 jobs. Details of the findings are summarized below:

Economic Activity

- Aviation provision impacts accounted for \$289.1 million of the \$3.5 billion. Of this, airlines accounted for \$130 million, airline support for \$10 million, ground transport for \$63 million, airport tenants for \$9.8 million, general aviation for \$17 million, and government operations for \$58.6 million.
- Aviation use impacts accounted for \$1.5 billion of the economic activity generated by the airport. Of this, air carrier visitors accounted for \$1.4 billion, general aviation visitors accounted for nearly \$26 million, airline crew overnight stays accounted for nearly \$6 million, and travel agencies accounted for over nearly \$40 million.

- The multiplier impact from aviation provision activities was estimated to be nearly \$299 million, and for aviation use activities was estimated to be \$1.4 billion.

Employment

- Aviation provision impacts account for 3,760 total jobs. Of these, 2,175 are at or near the airport, 1,065 are air crew, 205 are vehicle drivers, and 315 are elsewhere in the region.
- Other jobs as a result of the visitors who arrive to the airport and the multiplier impacts total 53,680. The study points out how the large difference between total jobs attributable to the Airport's existence versus the number of jobs created due to the provision of aviation services indicates how many other people are impacted by the airport's existence, even if they do not fly or work at the airport.

Other Impacts

The study also estimated the economic impact by industry. The industries that benefited the most from airport activity were lodging and amusements, eating and drinking establishments, the transportation industry, retail trade, and business services.

The state and local tax impacts of John Wayne Airport were also estimated in the study. Total tax revenue for the State was estimated to be \$82.1 million, and for local jurisdictions was estimated to be \$48.8 million.

This study was primarily focused on quantitative impacts and did not address other qualitative community benefits of the airport.

Sacramento International Airport (SMF)

An economic impact study that examined Sacramento International Airport, Sacramento Executive Airport, and Mather Airport was published on November 23, 1999. The study was commissioned by the County of Sacramento and conducted by Martin Associates. Prior to this study, Martin Associates conducted a previous economic impact study of Sacramento International Airport in October 1998 before Terminal A had been completed.

Methodology

The study was based on interviews, local economic data, and airport statistics and examined the impact in terms of jobs, personal income, state and local taxes, and revenue generated directly by airport activity. The study includes the impacts of visitors to the Sacramento area who use commercial air service at Sacramento International Airport. Interviews were conducted with all 48 tenants at the airport, and a 500 passenger survey was conducted to collect information on purpose of travel, resident versus non-resident, purchase patterns while in Sacramento, and mode of arrival and departure from the airport.

The airport system was divided into five sectors for purposes of the study: airline/airport service, freight transportation, passenger ground transportation, contract construction/consulting services, and visitor industry services.

The year analyzed was 1999.

Employment Impacts of Sacramento International Airport

Approximately 13,661 jobs in 1999 in the Sacramento area were related to activities of the Sacramento International Airport. A breakdown of these jobs is as follows:

- Direct jobs accounted for 2,672 of the total jobs. If airport activity were to cease, these jobs would be immediately discontinued. These jobs are also affected by changes in number of flights and passenger levels. Approximately 68 percent of these jobs were concentrated in the airline/airport service category.
- An additional 1,312 jobs were induced due to the purchases of goods and services within the region by the individuals holding the direct jobs.
- Approximately 789 indirect jobs were created due to the local spending on supplies and services by airport-related firms.
- Nearly 8,900 visitor industry jobs were created in the region as a result of visitors arriving at the Sacramento International Airport. Of these, over 6,600 were created within hotels, restaurants, retail outlets, entertainment, and recreational establishments due to visitor expenditures. The remaining 2,260 induced jobs are a result of the spending of the individuals who are in these visitor industries.
- Slightly over 43 percent of jobs were created in the City of Sacramento. Another 37 percent were created in the rest of Sacramento county, 6 percent in Yolo County, 15 percent in other parts of California, and 17 percent in the rest of the United States.

Revenue Impact

The total revenue impact of the Sacramento International Airport in 1999 was \$1.2 billion. Further information related to the revenue impact is summarized below:

- Nearly 86 percent was generated in the airline/airport services sector. Over six percent each was generated in the freight transportation and the passenger ground transportation sectors, and slightly over two percent was generated in the construction and consulting sectors.
- The study also broke down the revenue impact by type of activity. The majority of the revenue generated by the airport (\$1.1 billion) was attributable to passenger activity, followed by air cargo (\$74.4 million), construction and consulting (\$27.9 million), and general aviation (\$5.3 million).

Personal Income Impacts

Personal impacts – wages and salaries to the employees employed directly as a result of airport activity – totaled \$77 million in 1999. An additional \$80.3 million of personal income and purchases was induced by this spending, for a total of \$157.3 million.

Tax Impacts

Airport activity at the Sacramento International Airport generated state and local government tax revenue. State taxes were estimated to be \$12.7 million, and local and county taxes were estimated to be \$10.5 million, for a total tax impact of \$23.2 million in 1999.

Visitor Industry Impacts

The economic impact study for the Sacramento International Airport separated out the impact of the visitor industry. The major visitor impacts are as follow:

- Purchases made by visitors to the Sacramento area via the Sacramento International Airport generated \$392.9 million of business revenue to local businesses in visitor-related industries. The largest impacts were in the restaurant and hotel industries.
- Visitors to the area generated \$84.3 million in direct wages and salaries. After applying the multiplier, \$172.2 million in direct and induced earnings were created.
- Nearly \$52 million of state and local taxes were created as a result of visitors who came through the airport.

Other Issues

The study also estimated jobs related to, but not dependent upon the Sacramento International Airport. This portion of the study focused on freight users of the airport and was based on a study of air freight shippers conducted for San Francisco International Airport that determined that the average value of air shipments is approximately \$83 per pound. Based upon the number of pounds of air freight enplaned at the airport in 1999, Martin Associates estimated that the total value of air cargo shipped via the airport was approximately \$4.3 billion.

Ontario International Airport (ONT)

The most recent economic impact study for Ontario International Airport (ONT) was published in 1992. It was commissioned by the City of Los Angeles Department of Airports and conducted by Wilbur Smith Associates.

Methodology

The study divides the impacts into direct, indirect, and induced impacts. Direct impacts are defined in the study as impacts created by the provision of air transport services, including expenditures by airlines, ground support, airport concessions, airport ground access services, and government necessary to carry out aviation related businesses.

Indirect impacts are defined as those created by the use of aviation services, such as expenditures of visitors and flight crews, the “value added” component of air cargo, and commissions to travel agents. Induced impacts are defined as the result of the multiplier effect caused by direct and indirect impacts.

The impacts were measured in terms of economic activity, earnings, and jobs.

Summary of Findings

The study found that ONT had an annual economic impact of \$5.4 billion on the Southern California economy. The breakdown is as follows:

- The direct impact resulting from aviation activity on or near the airport was estimated to be \$413 million. Of this, \$40.7 million was estimated to be from airlines, \$17.6 million from air support, \$10.4 million from airport tenants, \$18.8 million from cargo and freight, \$9.5 million from government, \$22.5 million from ground transport, and \$293 million from other aircraft services.
- \$1.5 billion was generated off airport from expenditures related to the use of aviation services. Of these, visitor expenditures comprised the largest amount, estimated to be close to \$694 million. Air freight users were the next highest at \$787 million, and travel agents and crew expenditures accounted for the smallest amount at \$13.5 million and \$3.7 million respectively.
- \$3.5 billion was generated through the multiplier effect as the direct and indirect benefits filter through the local economy. The majority of the induced impact, nearly \$2.8 billion, was created through the multiplier effect of the indirect benefits. The remaining \$771 million was created as a result of the direct impacts.

The study also found that 5,044 jobs were directly attributable to ONT, and an additional 50,391 were indirectly related to aviation activity at ONT. Of the jobs directly attributable to ONT, 2,280 were related to aircraft services, 648 were in airlines, 562 were in cargo or freight, 476 in ground transportation, 460 in air support, 327 in government, and 291 through airport tenants. Total jobs created were 55,435.

Employment payroll at ONT generated \$155 million in direct earnings, and total direct, indirect, and induced earnings had an impact of \$1.3 billion in 1990. The industries most impacted were retail trade, transportation, business services, lodging and amusement, transportation equipment, restaurants, wholesale trade health service, and construction.

Other Issues

The study focused especially on the importance of visitors who arrive to the region via the airport and the importance of air freight services. According to the study, the indirect benefits from air freight contributed \$767 million to the local economy. The importance of the activity of the large UPS small package facility and other small package carrier operations to the companies that ship and receive freight was discussed. The study estimated the value added in the region due to goods transported through ONT as a proxy for the indirect benefits resulting from freight.

The limitation of the study is that it was conducted over 10 years ago.

San Jose International Airport (SJC)

The most recent economic impact study of the San Jose International Airport (SJC) was the Bay Area Economic Forum 1999 Report: “Air Transport and the Bay Area Economy.” There was also a 1998 Update report prepared by Martin Associates for San Jose International specifically.

Methodology

This report utilizes methodology developed by Martin Associates of Lancaster, Pennsylvania. It traced and measured the airport ripple effect using 100 percent direct surveys of the airports, tenants, and vendors of the airports, as well as large sample surveys of foreign and domestic visitors. Customized computer models of spending and employment ratios supplemented the study. The year analyzed was FY 1998-99.

Direct Business Revenue Impact

The direct business revenue impact was divided into five sectors: airline/airport service, freight transportation, passenger ground transportation, contract construction/consulting services, and visitor industry revenue. A summary of results related to the direct business revenue impact is provided below:

- Total airport direct business revenue for SJC was \$1.2 billion. Visitor industry revenue was \$3.4 billion, for a total of \$4.6 billion in 1999.
- Of the total airport direct business revenue (not including visitor industry revenue), 66 percent was generated in the airline/airport service sector, 21 percent in the freight transportation sector, 11 percent in the passenger ground transportation sector, and three percent in the contract construction/consulting services sector.
- Visitor revenue included all domestic and foreign arrivals who are not residents of the Bay Area and not connecting to other flights.
- San Jose’s revenue is relatively lower than those of the other Bay Area airports due to the high proportion of short haul traffic.

Employment Impact

The number of jobs created by San Jose International Airport were divided into categories, as summarized below:

- Direct jobs created by the revenue generated at SJC total 5,888. Induced jobs were 3,230, and indirect jobs were 817, for a total of 9,935.
- In addition, the visitor industry supported by the airports supported 51,191 direct jobs and 22,268 induced jobs, for a total of 73,549 jobs.

- In total, revenues generated by SJC and the supported visitor industry generated 83,484 jobs in the Bay Area in FY 1998-99.
- Of the 5,888 direct jobs created by revenues at SJC, 64 percent were in the airline/airport service sector, 13 percent in the freight transportation sector, 17 percent in the passenger ground transportation sector, and five percent in the contract construction/consulting services sector.

Personal Income Impact (Fiscal 1998-99)

The total personal income impact including direct, induced, and indirect for SJC in 1998-99 was nearly \$2.2 billion.

- As a result of the direct employment at SJC, nearly \$1.1 billion of direct personal income was created, of which, \$153 million was site-generated and \$909 million was visitor generated.
- An additional \$1.1 billion of personal income was induced by individual spending of this direct personal income (of which \$159 million was site generated and \$907 million was visitor generated).
- Indirect spending (by firm spending) totaled \$31 million.

Tax Generation

SJC generated \$864 million in federal taxes, of which, \$141 million was a result of site generated personal and corporate taxes, \$650 million was visitor-generated personal/corporate taxes, and \$72 million represented federal aviation specific tax revenue.

SJC also generated \$512 million in state and local taxes, of which \$61 million were site-generated and \$451 million was visitor generated tax revenue. There were no direct payments to the City.

Other Impacts

Other impacts applicable to all three Bay Area airports studied were discussed in the report and summarized under the Oakland International Airport section of this report.

Los Angeles International Airport (LAX)

Los Angeles International Airport recently completed a master plan that included a section on the economic impacts of LAX. The study was conducted by Hamilton, Rabinovitz & Alschuler, Inc. and published in January 2001. The study analyzes several alternative growth and expansion alternatives for LAX.

Methodology

This study utilizes an econometric forecasting model developed by Regional Econometric Models, Inc. (REMI). The methodology of this study differs from many of the other traditional airport economic impact studies in several ways:

- The REMI system uses dynamic modeling to support the development and evaluation of alternatives for future scenarios for LAX.
- The methodology used accounts for the network economic characteristics of regional airports and considers the impact of the large volume of connecting passenger and cargo traffic.
- This study accounts for productivity changes over time for future forecasts.

The four alternatives examined for LAX include: 1) the “No Project” scenario, assuming that no new improvements would be implemented during the next 20 years at LAX; 2) the “Build Alternative A- Five Runways-North Airfield” scenario; 3) the Build Alternative B-Five Runways – South Airfield” scenario; and 4) the “Build Alternative C-Four Runways” scenario.

Summary of Findings

This study is primarily focused on the marginal impacts of future alternative scenarios for LAX and therefore does not spend as much time addressing the current economic impact of the airport. The base year used in the study is 1996, and future scenarios are analyzed for impact in years 2003 and 2015. With regard to the quantitative economic impact of LAX in 1996, the study reached the following conclusions:

- The direct employment impact of LAX on the Southern California region in 1996 was approximately 407,670 jobs. This number is nearly 328,000 for Los Angeles County and close to 158,000 for the City of Los Angeles. The industries with the highest number of jobs were transportation equipment manufacturing, instruments manufacturing, air transportation, industrial machinery manufacturing, eating and drinking establishments, hotels, electronic equipment manufacturing, and apparel manufacturing. The employment number for Southern California was expected to grow to 425,000 by 2005.
- The study estimated that LAX had a \$60.4 billion impact on the Southern California region in 1996. This number was \$48.6 billion for Los Angeles County and \$20.9 billion for the City of Los Angeles. The direct economic impact of LAX in the Southern California economy was expected to grow to \$73.2 billion by 2005.

Other Impacts

In addition to providing the quantitative economic and employment impact for LAX in the Southern California region, the study included several case studies of various industries and firms that are dependent upon the existence of LAX. The study first examined the motion picture/television and emerging multimedia industry and the electronic manufacturing industry. These industries were viewed as both critical to the future regional economy and as highly dependent upon LAX.

For the motion picture industry, trends such as the need for high level Hollywood executives to travel frequently across the country and internationally and the increased use of telecommunications and digitized formats that could negatively affect demand for air cargo were discussed. Related to the electronics manufacturing industry, the report discussed the likely impacts of just in-time inventories, centralized distribution systems, and expanding Asian markets on services at LAX.

The study also included case studies of several economic sectors which are dependent upon LAX. The four sectors identified and examined were the cut flower, apparel processed food, and automotive parts industries. Issues such as the need to ship highly perishable items, the increasing number of overseas imports, the highly competitive nature of the apparel industry, and increasing frequency of automobile parts shipments were identified and discussed in relation to impact on LAX.

The appendix of the report provides in-depth case studies of the importance of LAX to the business of specific firms in these highlighted industries and sectors.

San Diego International Airport (SDIA)

The most recent economic impact study for San Diego International Airport (referred to as SDIA in the report) was prepared for the San Diego Association of Governments, the San Diego Unified Port Districts, the City of San Diego, the County of San Diego, the San Diego Regional Economic Development Corporation, and the San Diego Convention and Visitors Bureau. The study is titled “The Impact of Constrained Air Transportation Capacity on the San Diego Regional Economy” and was conducted by Hamilton, Rabinovitz, and Alschuler, Inc. in January 2001.

Methodology

The study focuses on the economic impact of four alternative future scenarios for SDIA. The REMI model (also used for the LAX study) was used to evaluate the impact of these four scenarios. The study also incorporates several case studies with businesses that rely upon SDIA for services.

Summary of Findings

The four alternative scenarios analyzed were defined in terms of number of air operations, passenger volume, and air cargo volume. The four scenarios analyzed are as follows:

1. The “Unconstrained Scenario” estimates the amount of air transportation service that would exist in the San Diego region in 2030 with no constraints on airport capacity. If unconstrained demand were to be met, the study estimated that air operations in the region would increase by 72 percent between 2000 and 2030, the number of passengers would grow by about 120 percent (with a majority growth in international

travel), and the amount of air cargo would increase by 447 percent between 2000 and 2030.

2. The second scenario is the “Constrained Scenario 1: Existing Facilities Scenario.” This alternative assumes that the region’s air transportation system existing in 1998 remains unchanged to 2030. Under this scenario, the estimated maximum number of air operations would be reached in about 2011, passenger volumes would increase until 2016, and air cargo capacity would be reached in 2006.
3. The third scenario analyzed is the “Constrained Scenario 2: Limited Expansion.” This alternative assumes that a limited amount of capacity if added to the regional air transportation system between 2010 and 2015, which would allow it to accommodate more activity than would be possible than in the existing facilities scenario. Under this scenario, air operations could reach 282,000 operations in 2013, passenger volumes could be increased up to 2017, and air cargo could be increased until 2014.
4. The fourth scenario, the “Constrained Scenario 3: Major Expansion,” assume that the region’s existing airport facilities are expended to their practical limits between 2015 and 2020. The operational capacity limit of this scenario would be reached in about 2023, but the passengers and cargo volume limits would be reached in 2019.

The study measured opportunity costs to the San Diego region from the three constrained air transportation capacity scenarios. A summary of the results is as follows:

- The difference between the unconstrained demand forecast and the constrained scenarios was \$8 billion for the existing facilities scenario, \$6 billion for the limited expansion scenarios, and \$4.6 billion for the maximum expansion scenarios.
- The difference in employment between the unconstrained demand forecast and the constrained scenarios was 56,277 jobs for the existing facilities scenario, 44,961 jobs for the limited expansion scenario, and 34,132 for the maximum expansion scenario.

Other Issues

The study also discussed the potential for constrained air transportation to discourage businesses now operating in the San Diego from staying in the region, estimates of the costs of delay that would be incurred by airline companies and passengers resulting from increased congestion, and public revenue impacts. The study includes interviews with 18 firms that are central to the future of the San Diego economy and are heavily dependent upon services provided at the airport.

San Francisco International Airport (SFO)

The most recent economic impact study conducted for San Francisco International Airport is “Air Transportation and the Bay Area Economy,” a report which includes an economic impact assessment of Bay Area airports. The study was published by the Bay Area Economic Forum in 1999 and utilizes methodology developed by Martin Associates

of Lancaster, Pennsylvania. The report traces and measures the airport ripple effect using 100 percent direct surveys of the airports, tenants, and vendors of the airports, as well as large sample surveys of foreign and domestic visitors. Customized computer models of spending and employment ratios supplement this data.

Direct Business Revenue Impact

The economic impact of SFO was divided into five sectors: airline/airport service, freight transportation, passenger ground transportation, contract construction/consulting services, and visitor industry revenue. Highlights of the revenue impact identified as part of the study are as follows:

- Total airport direct business revenue for SFO was \$15.4 billion. Visitor industry revenue was \$9.1 billion, for a total of \$24.6 billion in 1999.
- Of the total airport direct business revenue (not including visitor industry revenue), 83 percent was generated in the airline/airport service sector, 13 percent in the freight transportation sector, four percent in the passenger ground transportation sector, and less than one percent in the contract construction/consulting services sector.
- Visitor revenue included all domestic and foreign arrivals who are not residents of the Bay Area and not connecting to other flights.

Employment Impact

- Direct jobs created by the revenue generated at SFO total 34,893. Induced jobs are 20,020, and indirect jobs are 11,649, for a total of 66,562.
- In addition, the visitor industry supported by the airports supports 145,890 direct jobs and 62,832 induced jobs, for a total of 208,713 jobs.
- In total, revenues generated by SFO and the supported visitor industry generate 275,275 jobs in the Bay Area.
- Of the 34,893 direct jobs created by revenues at SFO, 86 percent were in the airline/airport service sector, six percent in the freight transportation sector, eight percent in the passenger ground transportation sector, and less than one percent in the contract construction/consulting services sector.

Personal Income Impact (Fiscal 1998-99)

- As a result of the direct employment at SFO, over \$3.8 billion of direct personal income was created, of which, \$1.3 billion was site-generated and \$2.5 billion was visitor generated.
- An additional \$3.8 billion of personal income was induced by individual spending of this direct personal income (of which \$1.3 billion was site generated and \$2.5 billion was visitor generated).
- Indirect spending (by firm spending) totaled \$415 million.

- The total personal income impact including direct, induced, and indirect for SFO in 1998-99 was \$8.1 million.

Tax Generation

- SFO generated \$3.6 billion in federal taxes, of which, \$1.1 billion was a result of site generated personal and corporate taxes, \$1.8 billion was visitor-generated personal/corporate taxes, and \$778 million was federal aviation specific tax revenue.
- SFO also generated \$1.7 billion in state and local taxes, of which \$409 million were site-generated and \$1.3 billion were visitor generated tax revenue.
- Direct payments to the City totaled \$21 million.

Other Impacts

The study addressed the important role that airports play in the Bay Area from many perspectives. The full discussion of these impacts is included under the Oakland International Airport summary.

SUMMARY OF SURVEY OF AIRPORT MANAGERS

ERA worked with JD Franz and Associates, a survey research firm based in Sacramento, to develop a survey questionnaire for the airport manager survey. A copy of the interview questionnaire and letter sent out to airport managers is contained in **Appendix A**. As shown, the survey addressed the following issues:

- Employment in airport management and operations
- Number and type of businesses at the airport
- Airport budget, including airport operations and construction
- Air cargo
- Commercial air service
- Community impacts
- Examples of importance of businesses for local businesses
- Recreation and tourism connected to the airports
- Types of clientele served by the airport
- Impact of September 11 on airport businesses.

The airport managers' responses are summarized by airport category below. The airport categories used are a combination of those defined by the Federal Government and by the California Department of Transportation Aeronautics Division. The names and definitions of the airport categories are described below:

- **Primary Hub Airport** – A primary hub airport is one that handles all regularly scheduled commercial airline traffic and has annual enplanements totaling 10,000 or more. Within this category, there are large, median, and small hubs, all based upon

percentage capture of total enplanements. The minimum requirement to qualify as a hub airport is capture of at least .05 percent of total enplanements.

- **Primary Non-Hub Airports** – A primary non-hub airport is also one that handles regularly scheduled commercial airline traffic and has annual enplanements totaling 10,000 or more. However, non-hub airports have less than .05 percent of total enplanements.
- **General Aviation** – General aviation airports must have at least 10 aircraft based at their locations and fewer than 2,500 scheduled enplanements. Within the federal general aviation category, the California Department of Transportation Aeronautics Division has created several sub-classifications: metropolitan, regional, and community.
- **A GA Community Airport** is one that provides access to other regions and states; is located near a small community or in a remote location; serves, but is not limited to, recreation flying, training, and local emergencies; accommodates predominantly single-engine aircraft under 12,500 pounds; and provides basic or limited services for pilots or aircraft.
- **A GA Regional Airport** is one that provides the same access as a Community airport, but also may provide international access; is located in an area with a larger population base than Community airport while serving a number of cities or counties; serves the same activities as Community airport with a higher concentration of business and corporate flying; accommodates most business, multi-engine, and jet aircraft, provides most services for pilots and aircraft including aviation fuel; has a published instrument approach, and may have a control tower.
- **A GA Metropolitan Airport** is one that serves the same activities as a Regional airport but is located in an urbanized area; provides for the same flying activities as a Regional airport with an emphasis on business, charter, and corporate flying; accommodates all business jet and turboprop aircraft with a higher level of activity than a Regional airport; provides full services for pilots and aircraft, including jet fuel; has a published instrument approach and a control tower; and provides flight planning facilities.
- **Non-NPIAS** – The final category of airports includes those that are not part of the National Plan of Integrated Airport Systems and are therefore not eligible for federal funding. These airports include many landing strips and smaller airports, most with fewer than 10 aircraft.

Primary Non-Hub Airports

There were 16 primary non-hub airports that responded to the survey. Their responses regarding employment, airport businesses, budget, and community impacts are summarized below.

Employment

The responses of primary non-hub airports to questions regarding airport administration and operations employment are shown in **Table 1**.

- The number of full-time equivalent (FTE) employees involved in airport administration and operations ranges from 2 to 12 at primary non-hub airports. The one exception is the Monterey Peninsula Airport, which reported a total of 43 FTE employees. The majority of these employees were reported to be local government employees.
- The median number of FTE employees in airport administration and operations based upon the responses is 6.5, and the average is 8.4. Lake Tahoe Airport and the Modesto City-County Airport are the two airports with the median number of employees. The average was clearly skewed by the high number of employees at the Monterey Peninsula Airport. The average without Monterey Peninsula Airport is 6.1 FTE employees.

Airport Businesses

The ERA survey asked about the number and type of fixed based operators (FBOs) on airport property as well as other types of businesses on airport property.

- As shown in **Table 2**, the number of fixed base operators ranges from zero at Arcata Airport to 43 at Monterey Peninsula Airport. Aircraft maintenance and repair was one of the most commonly reported services provided by FBOs, followed by fueling, flight charter, flight instruction, and corporate jet services.
- The median and average number of FBOs located at primary non-hub airports is six – Redding Municipal and Sonoma County Airports both have six FBOs at their airports.
- There is a very large range in number of other businesses at primary non-hub airports (see **Table 3**). As indicated, the number of other businesses reported ranges from two to over 200. The majority of responses are between two and 30. Meadows Field Airport reported 120 businesses, and Monterey Peninsula Airport reported 201 business. The median number of businesses is nine, and the average number is 31. Excluding Meadows Field and Monterey Peninsula Airport, there is an average of 11 other businesses located at primary non-hub airports.
- Other types of businesses include the following: ground transportation (taxi services), rental car agencies, restaurants, bars, and cafes, air cargo services, government services (e.g. California Department of Forestry), travel agencies, agricultural services such as crop dusting, security firms, machine shops, auto parking, medical services, and gift shops.

Operating and Construction Budget

The operating budgets by category reported for the primary non-hub airports are shown in **Table 4**, and **Table 5** contains the operating budgets by percentage breakdown.

- The budgets for primary non-hub airports range from \$333,400 at Inyokern Airport to slightly over \$9 million for McClellan-Palomar Airport.
- The median airport budget is approximately \$1.3 million. The average budget size is \$2.2 million. The average is so much higher than the median due to the large budget size of McClellan-Palomar Airport. Without this airport, the average budget size is \$1.7 million.
- The two largest budget categories are generally wages and salaries (combined with employee benefits) and expenditures on services and supplies. Wages and salary expenses comprise between eight to 42 percent of the total budget. The responses are fairly well spread out between these two numbers. Expenditures on services and supplies range from two to 60 percent of total budget.
- Average annual spending on construction at primary non-hub airports ranges from \$100,000 at Lake Tahoe Airport to \$8 million for Monterey Peninsula Airport, as indicated in **Table 6**. The median amount spent annually is close to \$1.2 million – Redding Municipal Airport and Arcata Airport have median-size construction budgets. The average construction budget, once again skewed upward by the large expenditures by Monterey Peninsula Airport on construction, is \$1.8 million.

Cargo and Commercial Air Service

The survey asked airport managers about cargo and commercial air services. The responses for primary non-hub airports are summarized below:

- All primary non-hub airports except for Lake Tahoe Airport and Sonoma County Airport indicated that they currently offer commercial air service (see **Table 7**). For those that do have commercial air service, the number of commercial airlines ranges from one to three. The average and median number of airlines is 1.6 and 1.5 respectively.
- The two airports that do not currently offer commercial air service have both had commercial flights in the past and expect to resume commercial flights in the future.
- Of the 16 primary non-hub airports, 14 indicated that they offer air cargo services. The two exceptions are Imperial County Airport and McClellan-Palomar Airport.
- For the airports that do have air cargo services, four airports indicated that a majority of the air cargo is enplaned, four indicated that a majority of air cargo is deplaned, four airports reported that half is enplaned and half is deplaned, and four airports did not know what percentage of air cargo was enplaned or deplaned.
- Only one airport indicated that the majority of cargo is belly cargo, eight indicated that the majority of cargo is carried by all cargo flights, and four indicated that air cargo at their airport is evenly split between all cargo and belly cargo.

Community Impacts

The primary non-hub airport managers were also asked about what community benefits are provided by their airports. The following benefits were identified as being important to local communities:

- Quick response to medical emergencies
- Access to remote areas
- Assistance with fire fighting efforts, particularly for forest fires
- Search and rescue missions
- Farming and agricultural benefits
- Important to attracting business to the local community and the development of nearby industrial parks
- Training academy for future commercial airline pilots
- Tax revenue that supports local schools
- Provision of connections to major airports.

Business Locations

When asked about the importance of their airports to the existence or expansion of businesses in the local community, 11 out of the 16 airports indicated that the airports provide important services to nearby businesses. Some examples are highlighted below:

- There are many industrial parks located near airports. Some of the businesses located in these industrial parks are heavy users of the airport.
- At Chico Airport, a company located near the airport ships its cooling systems nationwide through the airport.
- The Modesto City-County Airport gave several examples of businesses that utilize the airport, such as a satellite operation, Gallo Wines, and Foster Farms.
- High tech companies utilize services provided by the San Luis Obispo Airport.
- Two large manufacturing companies use the Visalia Municipal Airport.
- At the Arcata Airport, several businesses utilize the airport, including a graphic arts firm, the Ford Foundation, small cargo carriers, crab fishermen, and mushroom growers who ship their products overnight.

Tourism

The ERA survey asked airport managers specifically about the impacts of the airport on tourism to the local areas. All airport cited an impact on recreation and tourism in the region. Examples of connections between airports and tourism include the following:

- The Jack McNamara Field Airport supports sightseeing in the redwoods and fishing in the region.
- Tourists fly into the Sonoma County Airport to visit Sonoma's wineries.
- The Imperial County Airport is one of the closest California airports to Mexico and therefore attracts tourists. It also attracts visitors who go to the Colorado River for swimming and skiing.
- Lake Tahoe Airport is located in the heart of a tourist community. Visitors arrive via the airport to go skiing, boating, fishing, and hiking.
- Aracata Airport attracts coastal visitors, including movie stars.
- The McClellan Palomar Airport serves visitors to Legoland and the area's beaches.
- Many airports indicated their importance to recreational pilots.

Clientele

Airport managers were asked about their current mix of clientele. Responses covered a broad range, and included broad categories such as general aviation and commercial flights and specific categories such as business travelers, tourists, recreational flyers, medical emergencies, military, and agricultural users.

Impacts of September 11th

When asked about the impacts of September 11th on airport business, five airports reported a decrease in passenger activity, two airports reported increases in requests for direct services and corporate travel, and three cited an increase in airport security.

General Aviation Metropolitan Airports

There were 18 general aviation (GA) metropolitan airports that responded to the survey. Their responses regarding employment, airport businesses, budget, and community impacts are summarized below and in Tables 9 through 15.

Employment

The responses of GA metropolitan airports to questions regarding airport administration and operations employment are shown in **Table 9**.

- The number of FTE employees involved in administration and operations of GA metropolitan airports ranges from two to 100. The vast majority of all responses were between two and 10 – only three airports reported having more than 10 FTE employees. These airports are Zamperini Field Airport with 14 FTE employees, Camarillo Airport with 22 FTE employees, and Van Nuys Airport with 100 FTE employees.

- The median number of FTE employees at GA metropolitan airports is 6.5. The average number is nearly twice that at 12.9, primarily due to the exceedingly high number of employees at Van Nuys Airport. ERA staff called Van Nuys Airport management to double-check the accuracy of the survey response, and airport management did confirm the number of 100 FTE employees involved in airport administration and operations. Without Van Nuys Airport included, the average number of FTE employees for GA metropolitan airports is 7.7.

Airport Businesses

The ERA survey asked about the number and type of fixed based operators (FBOs) on airport property as well as other types of businesses on airport property (see **Table 10**).

- The question related to the number of fixed-base operators was implemented somewhat inconsistently in the survey. As shown in Table 10, the range of FBOs located at the GA metropolitan airports is most likely incorrect, particularly for airports towards the upper end of the range. According to the survey results, the number of fixed base operators ranges from two to 23 at GA metropolitan airports.
- The median and average number of FBOs are somewhat high given the probable misreporting of total number of FBOs. The median number of FBOs is 7.5, and the average is 9.4.
- Aircraft maintenance and repair, flight instruction, and hangar rental are most the common FBO activities for GA metropolitan airports. Less common, although still prevalent, are fueling, corporate jet services, and flight charter.
- The number of other (non-FBO) businesses at GA metropolitan airports ranges from zero at Palo Alto Airport to 100 at Van Nuys Airport (see **Table 11**). The median number of other businesses is 7.5. Jack Northrop Field/Hawthorne Airport and El Monte Airport have the median number of other businesses. The average number of other businesses at GA metropolitan airports is 18.7. Excluding Van Nuys Airport, the average is 13.9 other businesses.
- Other types of businesses including the following: agriculture and farming, industrial, medical, mechanical, restaurants, rental car agencies, insurance, museums, media, golf course, hotels, service industries, and retail.

Operating and Construction Budget

The operating budgets by category reported for the GA metropolitan airports are shown in **Table 12**, and **Table 13** contains the operating budgets by percentage breakdown.

- The budgets for GA metropolitan airports range from \$539,000 at Palo Alto Airport to \$8 million at Van Nuys Airport. With the exception of Van Nuys Airport, all airports are between \$539,000 and \$3 million.
- The median airport budget is approximately \$1.8 million. The average budget size is \$2.1 million. The average is slightly higher than the median due to the large budget

size of Van Nuys Airport. Without this airport, the average budget size is \$1.7 million.

- The two largest budget categories are generally wages and salaries (combined with employee benefits) and expenditures on services and supplies. Wages and salary expenses comprise between 10 and 60 percent of total expenditures. The responses are fairly well spread out between these two numbers. Expenditures on services and supplies range from two to 66 percent of total budget.
- Average annual spending on construction at GA metropolitan airports ranges from \$0 at Sacramento Executive Airport to \$3.4 million at Van Nuys Airport (see **Table 14**). The median amount spent annually is \$250,000, and the average is \$953,533. There are four airports – Santa Monica, Hayward Executive, Sacramento Mather, and Van Nuys Airport – that on average spend \$2 million or more on construction annually.

Air Cargo

Four of the GA metropolitan airports indicated that they offer air cargo services (see **Table 15**). Three of the four airports reported that the majority of air cargo at their airports is enplaned rather than deplaned. Van Nuys Airport indicated that 50 percent of cargo is enplaned, and 50 percent is deplaned. All four airports reported that air cargo is carried by all cargo carriers rather than as belly cargo.

Community Impacts

A number of community benefits provided by airports in their local communities were identified by the GA metropolitan airports. Benefits generally fell into the following categories:

- Public safety, such as Sheriff helicopters, law enforcement training, the Drug Enforcement Agency, civil air patrol, and fire services.
- Medical emergency services, such as life flights, air ambulance, and emergency training.
- Generation of local tax revenue that support schools and other public services.
- Provision of entertainment through activities such as air shows, antique car shows, and museums.
- Location for public and community events such as homeowners' association meetings, Rotary Club and Lion's Club meetings, public safety information meetings, programs for disadvantaged youth, and open houses.
- Agricultural services such as farm spraying.
- Flight training and education.
- Role as a reliever airport for major airports.

Business Locations

When asked about the importance of their airports to the existence or expansion of businesses in the local community, 10 out of the 18 GA metropolitan airports answered that they do not play a role in attracting businesses to the area. For the eight that did reply positively to this question, examples are listed below:

- Bracket Field Airport discussed the role of the airport in the growth of businesses located in the Bracket Interior.
- Camarillo Airport provided examples of companies that have planes that fly in and out of the airport such as Mercedes Benz and Salem Communications.
- Livermore Municipal Airport discussed the importance of the airport to businesses such as Sandia Labs, Lawrence Livermore Labs, Chevron, and People Soft, a major software company.
- The Montgomery Field Airport is important to several businesses including Howard Leight Enterprises which provides ear protection services.
- Sacramento Mather Airport raised the importance of overnight air cargo services to many local businesses.
- Many businesses within the film industry benefit from the presence of Santa Monica Airport.
- Other airports discussed the importance of their airports to businesses in the visitor serving industries such as hotels and restaurants.

Tourism

Almost all GA metropolitan airports felt that they play an important role in supporting tourism to their local communities. Six of the airports discussed the importance of recreational flying, and four brought up examples of people flying in to play at golf courses in the area. Other examples include people flying in to GA metropolitan airports for general sightseeing, to visit vineyards, to go fishing, and for car shows.

Clientele

Airport managers reported their mix of clientele as including general aviation, corporate travel, recreational flying, tourists, air cargo, and private aviation.

Unique Characteristics

Airports were asked about any characteristics that make them unique. Answers included a unique location or setting, room for growth, small size, military airport conversion to a commercial airport, and an affluent clientele base.

Impacts of September 11th

When asked about the impacts of September 11th on airport business, 11 airports out of 18 indicated that they have been affected. Five airports experienced decreased activity in

one or more areas of service, while three airport experienced increased activity. The increased activity was attributed to increased corporate travel and general aviation due to traffic moving out of larger, neighboring airports.

General Aviation Regional Airports

There were 67 general aviation (GA) regional airports that responded to the survey. Their responses regarding employment, airport businesses, budget, and community impacts are summarized below and in Tables 16 through 22.

Employment

The responses of GA regional airports to questions regarding airport administration and operations employment are shown in **Table 16**.

- The number of FTE employees involved in administration and operations of GA regional airports ranges from zero for Redlands Municipal Airport and Rohnerville Airport to 18 at Southern California Logistics and Tahoe-Truckee Airport
- The median number of FTE employees at for GA regional airports is two. There are 12 airports in this category with two FTE employees. The average number of FTE employees at GA regional airports is slightly higher at 3.6.

Airport Businesses

The ERA survey asked about the number and type of fixed based operators (FBOs) on airport property as well as other types of businesses on airport property (see **Table 17**).

- The question related to the number of fixed-base operators was implemented somewhat inconsistently in the survey. As shown in Table 17, the range of FBOs located at the GA regional airports is most likely incorrect, particularly for airports towards the upper end of the range. According to the survey results, the number of fixed base operators ranges from zero at eight of the GA regional airports to 23 at Gillespie Field Airport.
- The median and average number of FBOs is six.
- The division of FBO activities at GA regional airports appears to be similar to the division for GA metropolitan airports. Aircraft maintenance and repair, flight instruction, and hangar rental are most the common FBO activities for GA regional airports. Less common, although still prevalent, are fueling, corporate jet services, and flight charter.
- The number of other (non-FBO) businesses at GA regional airports ranges from zero at eight airports to 90 at Southern California Logistics Airport (see **Table 18**). The median number of other businesses is four. The average number of other businesses at GA regional airports is 8.3. Only seven GA regional airports have over 20 other businesses.

- Other types of businesses include flight services, retail establishments, manufacturing businesses, and research and development companies.

Operating and Construction Budget

The operating budgets by category reported for the GA regional airports are shown in **Table 18**, and **Table 19** contains the operating budgets by percentage breakdown.

- The budgets for GA regional airports have a very broad range, from close to \$60,000 at Twentynine Palms Airport to \$9.8 million at Gillespie Field Airport. While Gillespie Field Airport is much higher than the rest, the other airport budgets are still spread throughout the \$60,000 to \$4 or \$5 million range.
- The median airport budget is approximately \$482,000. The average budget size is slightly over \$1 million. The average is skewed higher than the median due to the large budget size of Gillespie Field Airport. Without this airport, the average budget size is \$862,000.
- The percentage of expenditures broken down by category also exhibits tremendous variance. However, similar to the two previous airport category responses, wages and salaries generally account for the highest percentage of the budget, followed by expenditures on services and supplies.
- Average annual spending on construction at GA regional airports ranges from \$0 at several airports to \$5.6 million at Ramona Airport (see **Table 20**). It should be noted that each airport manager's interpretation of "average annual construction spending" could be different. Only 12 airports reported average annual construction spending of \$1 or greater. The median for construction spending annually for GA regional airports is \$150,000; the average amount spent annually for this category is \$536,000.

Air Cargo

Within this category, 13 airports indicated that they provide air cargo services (see **Table 22**). Of these, 11 airports reported that the majority of air cargo is enplaned. Southern California Logistics Airport reported that the majority of their cargo is deplaned, and two airports (Bishop and Ukiah) indicated that air cargo at their airports is split fairly evenly between enplaned and deplaned cargo.

Ten airports reported that 100 percent of cargo is carried by all cargo carriers. One airport, Benton Field, reported an even split between all cargo and belly cargo. Susanville Airport reported that approximately 30 percent of cargo is belly cargo, and the remaining 70 percent is all cargo. The type of air cargo transported includes packages, bank notes, heavy freight, and satellites.

Community Impacts

The vast majority of the airports indicated that they do provide valuable community services to local communities surrounding the airports. Benefits generally fell into the similar categories to those discussed under GA metropolitan airports:

- Public safety and emergency services (discussed by 35 airports)
- Tax generation and revenue impact for local public services (mentioned by 14 airports)
- Community building and outreach (11 airports discussed this benefit)
- Role in attracting businesses to community (six airports discussed this benefit under this question, although many more responded favorably to the following question about business relocation and generation)
- Agriculture (several airports discussed various aspects of aviation's relationship to agriculture and farming)
- Importance of air cargo (one airport discussed this community benefit)

Business Locations

When asked about the importance of their airports to the existence or expansion of businesses in the local community, 22 airports stated that they were a factor in the relocation and retention of nearby businesses to the vicinity. Types of businesses that were reported as associated with the airport in some way include services, agriculture, manufacturing, industrial, and resorts.

Tourism

GA regional airports play an important role in linking visitors to California to many of California's natural outdoor recreational areas. Many airports indicated that visitors fly in to their airports to specifically reach areas that are more remote for various types of outdoor recreation, including:

- Visiting regional parks
- Sightseeing in small, historic towns
- Skiing
- Golf
- Fishing
- Visiting wineries
- Recreational flying
- Hiking
- Rafting
- Camping
- Visiting resorts

Clientele

Airport managers responded in many ways when asked about their current mix of clientele. The most common responses were corporate/business travel and general aviation. More specific answers included recreational flying, military, tourists, private flights, charter flights, public safety / emergency flights, wealthy clientele, commercial, air cargo, and heavy aircraft.

Approximately 26 airports indicated interest in changing the mix of future clientele. Target clientele included business and corporate travelers, tourists, air cargo, commercial airlines, general aviation, agriculture, recreational flying, and public safety and emergency flights.

Unique Characteristics

Airports were asked about any characteristics that make them unique. Answers included a unique location or setting, history, potential for growth, length of runway, and conversion from a military base.

Impacts of September 11th

When asked about the impacts of September 11th on airport business, 15 airports reported a decrease in flight activity, and three airports reported a decrease in revenue. Five airports discussed an increase in flight activity, primarily from business travelers chartering planes. Other effects mentioned include temporary airport shutdowns, increased security, increased awareness of clientele, and an increase in flight training services.

General Aviation Community Airports

There were 72 general aviation (GA) community airports that responded to the survey. Their responses regarding employment, airport businesses, budget, and community impacts are summarized below and in Tables 23 through 29.

Employment

The responses of GA community airports to questions regarding airport administration and operations employment are shown in **Table 23**.

- The number of FTE employees in administration and operations of GA regional airports ranges from zero for 13 airports to 12 at Hesperia Airport. Many airports are managed by one person who oversees several airports or an entire city or county department.
- The median number of FTE employees at GA community airports is one. There are 15 airports that have the median number of FTE employees. The average number of FTE employees is 1.8. There are 12 airports in this category with two FTE employees. The average number of FTE employees at GA community airports is slightly higher at 3.6.

Airport Businesses

The ERA survey asked about the number and type of fixed based operators (FBOs) on airport property as well as other types of businesses on airport property (see **Table 24**).

- GA community airports have between zero and 10 FBOs – 25 of the airports do not have any FBOs serving the airport. California City Municipal Airport has the most FBOs. The median number of FBOs is one, and the average number is 2.15.
- The service performed most frequently by FBOs at GA community airports is aircraft maintenance and repair. Fueling, hangar rental, and flight instruction services are not as frequently offered as aircraft maintenance repair, but still offered in a fair number of airports. Very few GA community airports provide corporate jet services.
- The number of other (non-FBO) businesses at GA community airports for all airports except for Castle Airport ranges from zero to 10. According to the survey, 35 of the GA community airports do not have any other businesses on airport property (see **Table 25**). Castle Airport is part of an industrial park and therefore reported 59 other businesses. The median number of other businesses is one, and the average number of other businesses is slightly over two. When Castle Airport is excluded from the calculation; the average number of other businesses is 1.3.
- Other types of businesses include retail establishments, service providers, manufacturers, and crop dusters.

Operating and Construction Budget

The operating budgets by category reported for the GA regional airports are shown in **Table 26**, and **Table 27** contains the operating budgets by percentage breakdown.

- The budgets for GA community airports have a very broad range, from \$0 at four airports (Furnace Creek, New Coalinga, Paradise Skypark, and Ranchoero Airport to \$2.3 million at Los Banos Airport.
- The median airport budget is approximately \$101,000. The average budget size is nearly \$224,000.
- The percentage of expenditures broken down by category also exhibits tremendous variance. However, similar to the three previous airport category responses, wages and salaries generally account for the highest percentage of the budget, followed by expenditures on services and supplies.
- Average annual spending on construction at GA community airports ranges from \$0 to \$3 million (see **Table 28**). There are 27 airports that reported that they, on average, have no expenditures for construction at the airport. The median level of spending on construction is \$10,000, and the average amount is \$143,900. There are three airports with average annual construction expenditures over \$1 million: Alturas Municipal Airport, Cameron Air Park Airport, and Red Bluff Municipal Airport.

Air Cargo

Only four of the GA community airports indicated that they have air cargo services (see **Table 29**). All of the airports have 100 percent all cargo carriers, and all four responded that the cargo is fairly evenly split between enplaned and deplaned cargo. The GA community airports primarily transport small packages.

Community Impacts

The GA community airports raised many important impacts that they have on their local communities. Examples are highlighted below:

- Fire fighting – Many of the GA community airports discussed the importance of their airports in fighting forest fires.
- Medical emergencies, including Medivac, Mercy Flights, and other air ambulance services.
- Tourism – The GA community airports are used by tourists especially to access some of the more remote areas of California.
- Catalyst for economic growth – Some of the GA community airports indicated that they provide corporate flights or have connections with businesses at industrial parks. Corporate flights, industrial parks.
- Agriculture – Many of these airports support agriculture through spraying programs or through connections with agricultural companies in the area.
- Community gatherings – Airports provide a place for comity gatherings such as Rotary clubs meetings and church socials.
- Recreational flying.

Business Locations

Close to 20 airports responded that they are an important factor in the location or retention of businesses to the local area. Types of businesses that benefit from the presence of these GA community airports include manufacturing firms, flight services, wineries, agriculture companies, resorts, and parachute jumping schools.

Tourism

Similar to GA regional airports, the GA community airports play an important role in bringing tourists to many of California's outdoor recreational areas. The airports indicated that tourists fly into their airports for the following activities: sightseeing, fishing, hunting, recreational flying, visiting National or State Parks, hiking, golfing, camping, biking, and visiting wineries.

Clientele

GA community airport managers reported their current mix of clientele as general aviation. Some also specified categories such as corporate or business travel, private clients, tourism, agriculture, recreational flyers, public safety, and military.

Target future clientele for GA community airports includes corporate and business, tourists, charter flights, and air cargo.

Unique Characteristics

GA community airports brought up several issues when asked about unique characteristics. Characteristics mentioned most often include location, size of runway, setting, and access to remote areas. Other unique characteristics include history or age, military operations, night operations, agricultural operations, seaplane operations, and hospitality of airport to consumers.

Impacts of September 11th

The impact of September 11th was primarily negative for GA community airports. The most common effects discussed were decreased flight activity and increased security. Other airports experienced increases in insurance premiums, decreases in fuel sales, and difficulty finding employees. Only one airport experienced increased flight activity as a result of the events of September 11th.

Non-NPIAS Airports

There were 18 non-NPIAS airports that responded to the survey. Their responses regarding employment, airport businesses, budget, and community impacts are summarized below and in Tables 30 through 35.

Employment

The responses of non-NPIAS airports to questions regarding airport administration and operations employment are shown in **Table 30**.

- The number of FTE employees in administration and operations at non-NPIAS airports ranges from zero to two. The range is much smaller than for all other categories. Many airports are managed by one person who oversees an entire city or county department.
- The median number of FTE employees at non-NPIAS airports is one, and the average number of FTE employees is .9.

Airport Businesses

The ERA survey asked about the number and type of fixed based operators (FBOs) on airport property as well as other types of businesses on airport property (see **Table 31** and **32**).

- As discussed previously, there was some discrepancy in how the survey question related to FBOs was asked and reported; therefore, the results for non-NPIAS airports are most likely not accurate. The range recorded from the surveys is between zero and 13 FBOs. The more probable range based upon responses to services provided by FBOs is between zero and three.
- The median number of FBOs at non-NPIAS airports is one. The average is not applicable since it was probably skewed by incorrect results.
- Hangar rental and aircraft maintenance and repair are the most commonly provided services at non-NPIAS airports. Fueling, flight instruction, and flight charter services are also provided, though less commonly.
- The number of other (non-FBO) businesses at non-NPIAS airports ranges from zero to three. The median number is .5 and average is .9 businesses per airport.
- Types of other businesses include bed and breakfast inns, manufacturing firms, restaurants, retail shops, distribution centers, RV parks, and flying clubs.

Operating and Construction Budget

The operating budgets by category reported for the non-NPIAS airports are shown in **Table 33**, and **Table 34** contains the operating budgets by percentage breakdown.

- The budgets for non-NPIAS airports tend to be very low, ranging from \$2,000 at Borges-Clarksburg Airport to \$127,000 at Selma Airport.
- The median airport budget is \$14,750. The average budget size is slightly over \$34,000.
- The distribution of expenditures by category is more evenly split for non-NPIAS airports than for any other airport type, primarily due to their relatively small budgets. For example, wages and salaries comprise between zero and 31 percent of total operating budget. Expenditures on services and supplies range from zero to 43 percent. Insurance spending ranges from zero to 38 percent of total operating budget.
- Average annual spending on construction at non-NPIAS airports ranges from \$0 to \$200,000 (see **Table 35**). The median amount spent on average on construction annually is \$2,000, and the average amount is \$19,383. The average is much higher than the median due to the response of Hi Desert – this airport indicated that they spend \$200,000 annually on average on construction. Other airports reported average spending primarily between \$0 and \$10,000.

Air Cargo

None of the non-NPIAS airports offer air cargo services.

Community Impacts

Despite their small size, the non-NPIAS airports still discussed many of community benefits that were raised by other types of airports. The primary community benefits

raised were public safety, medical services, provision of recreation, catalytic role in attracting businesses, provision of access to remote areas, and generation of taxes for local services.

Business Locations

One-third of the 15 non-NPIAS airports that participated in the survey stated that there are businesses located near them because of the airport. Types of businesses that rely upon the airports for services include technology companies, manufacturing firms, restaurants, aircraft repair businesses, and dairies.

Tourism

Nearly half of the non-NPIAS airports indicated that their airport plays an important role. Aviation supported tourist activities around non-NPIAS airports include recreational flying, drag racing, model aircraft shows, rock climbing, fishing, golf, and visiting vineyards.

Clientele

Current clientele for non-NPIAS airports includes general aviation, recreational flyers, emergency flights, and agriculture. Three airports indicated a desire to change the mix of clientele. Target clientele include air cargo, foreign trade, general aviation, and emergency services.

Unique Characteristics

Unique characteristics discussed by non-NPIAS airports include proximity to natural environments, a grass runway, and the age of the airport.

Impacts of September 11th

Only three airports noticed an impact from the results of September 11th. All three reported a decrease in airport activity and increased security.

IDENTIFICATION OF SPECIAL TOPIC AREAS

The survey of airport managers was useful in identifying quantitative measures of airport impact that will be used as inputs into the economic modeling process. However, airport managers also provided a tremendous amount of information related to the non-quantifiable, qualitative benefits that airports provide to local communities. ERA categorized these benefits into several special topic areas that will be researched more fully for the final report. The special topic areas are presented below:

1. The importance of the Sacramento regional airport system as a case study of how different types of airports can work together to provide comprehensive services to a given area.
2. The role of the system of limited use airports in California.

3. Aviation's role in supporting the California wine industry.
4. Military base conversion and airports.
5. The importance of aviation to California's agriculture industry.
6. The catalytic effect that airports have on economic development and business recruitment and retention.
7. The importance of airports in emergency response and fire services, particularly fighting forest fires in remote locations.
8. The role that airports play in providing medical services, including air ambulance, organ donations, and transport of patients with chronic illnesses to treatment facilities.
9. The importance of airports to law enforcement and public safety efforts, including drug control, training, transporting prisoners, border patrol, and general policing efforts.
10. The role of airports in supporting local communities as "good neighbors," including providing space for community events and functions, supporting educational institutions at all levels, putting on open houses and airport tours, supporting aviation programs for youth, and holding fundraisers for charities.
11. The importance of air cargo services.
12. The role that airports play in international trade and commerce and in linking California to the rest of the world.
13. The importance of aviation to tourism California, including major tourist locations as well as outdoor recreation.
14. Aviation and the film industry.
15. Aviation education and innovation, including flight academies, experimental flyers, helicopter schools, museums, and commercial airline training.
16. Access to remote communities.